

WE CLAIM:

1. A protein derived from an enterically transmitted non-A/non-B viral hepatitis agent whose genome contains a region which is homologous to a coding region of the 1.33 kb DNA EcoRI insert present in plasmid pTZKF1(ET1.1) carried in E. coli strain BB4 and having ATCC deposit no. 67717.

2. The protein of claim 1, which is encoded by a complete coding region within said 1.33 kb EcoRI insert.

3. A recombinant protein derived from an enterically transmitted nonA/nonB viral hepatitis agent whose genome contains a region which is homologous to a coding region of a DNA molecule having a first sequence (SEQ ID NO.1):

AGACCTGTCC CTGTTGCAGC TGTCTACCA CCCTGCCCG AGCTCGAACA GGGCCTTCTC 60  
TACCTGCCCC AGGAGCTCAC CACCTGTGAT AGTGTGTA CATTGAATT AACAGACATT 120  
GTGCACTGCC GCATGGCCGC CCCGAGCCAG CCGAAGGCCG TGCTGTCCAC ACTCGTGGGC 180  
CGCTACGGCG GTCGCACAAA GCTCTACAAT GCTTCCCACT CTGATGTTTCG CGACTCTCTC 240  
GCCCGTTTTA TCCCGGCCAT TGGCCCCGTA CAGGTTACAA CTGTGAATT GTACGAGCTA 300  
GTGGAGGCCA TGGTCGAGAA GGGCCAGGAT GGCTCCGCCG TCCTTGAGCT TGATCTTTGC 360  
AACCGTGACG TGTCCAGGAT CACCTTCTC CAGAAAGATT GTAACAAGTT CACCACAGGT 420  
GAGACCATTG CCCATGGTAA AGTGGGCCAG GGCATCTCGG CCTGGAGCAA GACCTTCTGC 480  
GCCCTCTTTG GCCCTTGGTT CCGCGCTATT GAGAAGGCTA TTCTGGCCCT GCTCCCTCAG 540  
GGTGTGTTTT ACGGTGATGC CTTTGATGAC ACCGTCTTCT CGGCGGCTGT GGCCGCAGCA 600  
AAGGCATCCA TGGTGTGTTGA GAATGACTTT TCTGAGTTTG ACTCCACCCA GAATAACTTT 660  
TCTCTGGGTC TAGAGTGTGC TATTATGGAG GAGTGTGGGA TGCCGCAGTG GCTCATCCGC 720  
CTGTATCACC TTATAAGGTC TCGTGGATC TTGCAGGCC CGAAGGAGTC TCTGCGAGGG 780  
TTTTGAAGA AACACTCCGG TGAGCCCGGC ACTCTTCTAT GGAATACTGT CTGGAATATG 840  
GCCGTTATTA CCCACTGTTA TGACTTCCGC GATTTTCAGG TGGCTGCCTT TAAAGGTGAT 900

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	GATTCGATAG TGCTTTGCAG TGAGTATCGT CAGAGTCCAG GAGCTGCTGT CCTGATCGCC	960
	GGCTGTGGCT TGAAGTTGAA GGTAGATTC CGCCGATCG GTTGTATGC AGGTGTTGTG	1020
5	GTGGCCCCG GCCTTGGCGC GCTCCCTGAT GTTGTGCGT TCGCCGGCCG GCTTACCGAG	1080
	AAGAATTGGG GCCCTGGCCC TGAGCGGGCG GAGCAGCTCC GCCTCGCTGT TAGTGATTC	1140
10	CTCCGCAAGC TCACGAATGT AGCTCAGATG TGTGTGGATG TTGTTTCCCG TGTTTATGGG	1200
	GTTTCCCCTG GACTCGTTCA TAACCTGATT GGCATGCTAC AGGCTGTTGC TGATGGCAAG	1260
	GCACATTTC CTGAGTCAGT AAAACCAGTG CTCGA	1295
15	a second sequence (SEQ ID NO.5):	
	TCGAGCACTG GTTTTACTGA CTCAGTGAAA TGTGCCTTGC CATCAGCAAC AGCCTGTAGC	60
	ATGCCAATCA GGTATGAAC GAGTCCAGGG GAAACCCCAT AAACACGGGA AACACATCC	120
20	ACACACATCT GAGCTACATT CGTGAGCTTG CGGAGGAAAT CACTAACAGC GAGGCGGAGC	180
	TGCTCCGCC GCTCAGGGCC AGGGCCCCAA TTCTTCTCGG TAAGCCGGCC GGCGAAGCGC	240
25	ACAACATCAG GGAGCGCGCC AAGGCCGGGG GCCACCACAA CACCTGCATA CAAACCGATC	300
	GGGCGGAAAT CTACCTTCAA CTCAAGCCA CAGCCGGCGA TCAGGACAGC AGCTCCTGGA	360
	CTCTGACGAT ACTCACTGCA AAGCACTATC GAATCATCAC CTTTAAAGGC AGCCACCTGA	420
30	AAATCGCGGA AGTCATAACA GTGGGTAATA ACGGCCATAT TCCAGACAGT ATTCCATAGA	480
	AGAGTGCCGG GCTCACCGBA GTGTTTCTTC CAAAACCCTC GCAGAGACTC CTTGCGGGCC	540
35	TGCAAGATCC ACGCAGACCT TATAAGGTGA TACAGGCGGA TGAGCCACTG CGGCATCCCA	600
	CACTCCTCCA TAATAGCACA CTCTAGACCC AGAGAAAAGT TATTCTGGGT GGAGTCAAAC	660
	TCAGAAAAGT CATTCTCAA CACCATGGAT GCCTTTGCTG CGGCCACAGC CGCCGAGAAG	720
40	ACGGTGTGAT CAAAGGCATC ACCGTAAAC ACACCCTGAG GGAGCAGGGC CAGAATAGCC	780
	TTCTCAATAG CGCGGAACCA AGGGCCAAAG AGGGCGCAGA AGGTCTTGCT CCAGGCCGAG	840
45	ATGCCCTGGC CCACTTTACC ATGGGCAATG GTCTCACCTG TGGTGAACCT GTTACAATCT	900
	TTCTGGAAGA AGGTGATCCT GGACACGTCA CGGTTGCAAA GATCAAGCTC AAGGACGGCG	960
	GAGCCATCCT GGCCCTTCTC GACCATGGCC TCCACTAGCT CGTACAATTC ACAAGTTGTA	1020
50	ACCTGTACGG GGCCAATGGC CGGGATAAAA CGGGCGAGAG AGTCGCGAAC ATCAGAGTGG	1080
	GAAGCATTGT AGAGCTTTGT GCGACCGCCG TAGCGGCCCA CGAGTGTGGA CAGCACGGCC	1140
55	TTGCGCTGGC TCGGGGCGGC CATGCGGCAG TGCACAATGT CTGTAAATTC AAATGTTACG	1200

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ACACTATCAC AGGTGGTGAG CTCCTGGGGC AGGTAGAGAA GGCCCTGTTC GAGCTCGGGG 1260  
CAGGGTGGTA GAACAGCTGC AACAGGGACA GGTCT 1295  
5 a third sequence (SEQ ID NO.6):  
AGGCAGACCA CATATGTGGT CGATGCC ATGGAGGCC ATCAGTTTAT TAAGGCTCCT 57  
GGCATCACTA CTGCTATTGA GCAGGCTGCT CTAGCAGCGG CCAACTCTGC CCTGGCGAAT 117  
10 GCTGTGGTAG TTAGGCCTTT TCTCTCTCAC CAGCAGATTG AGATCCTCAT TAACCTAATG 177  
CAACCTCGCC AGCTTGTTTT CCGCCCCGAG GTTTTCTGGA ATCATCCCAT CCAGCGTGTC 237  
ATCCATAACG AGCTGGAGCT TTAGTGGCGC GCGGCTCCG GCGGCTGTCT TGAATTTGGC 297  
15 GCCCATCCCC GCTCAATAAA TGATAATCCT AATGTGGTCC ACCGCTGCTT CCTCCGCCCT 357  
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20 CGGCGTTCCG CGCTGCGCGG GCTTCCCGCT GCTGACCGCA CTTACTGCCT CGACGGGTTT 477  
TCTGGCTGTA ACTTTCCCGC CGAGACTGGC ATCGCCCTCT ACTCCCTTCA TGATATGTCA 537  
CCATCTGATG TCGCCGAGGC CATGTTCCGC CATGGTATGA CGCGGCTCTA TGCCGCCCTC 597  
25 CATCTCCGC CTGAGGTCTT GCTGCCCCCT GGACATATC GCACCGCATC GTATTTGCTA 657  
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30 CACGATGTCT CCAACTTGCG CTCCTGGATT AGAACCACCA AGGTTACCGG AGACCATCCC 777  
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CCGGAGCCAT CACCTATGCC TTATGTTCTT TACCCCGGT CTACCGAGGT CTATGTCCGA 897  
35 TCGATCTTCG GCCCGGGTGG CACCCCTTCC TTATTCCAA CCTCATGCTC CACTAAGTCG 957  
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40 GATGACCAAG CCTTTTGCTG CTCCCGTTTA ATGACCTACC TTCGCGGCAT TAGCTACAAG 1077  
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45 ATATCCAAGG GGATGCGTCG TCTGGAACGG GAGCATGCCC AGAAGTTTAT AACACGCCTC 1257  
TACAGCTGGC TCTTCGAGAA GTCCGGCCGT GATTACATCC CTGGCCGTCA GTTGGAGTTC 1317  
50 TACGCCAGT GCAGGCGCTG GCTCTCCGCC GGCTTTTCATC TTGATCCACG GGTGTTGGTT 1377  
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TGCTGCTTCA TGAAGTGGCT TGGTCAGGAG TGCACCTGCT TCCTTCAGCC TGCAGAAGGC 1497  
55 GCCGTCGGCG ACCAGGGTCA TGATAATGAA GCCTATGAGG GGTCCGATGT TGACCCTGCT 1557

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	GAGTCCGCCA TTAGTGACAT ATCTGGGTCC TATGTCGTCC CTGGCACTGC CCTCCAACCG	1617
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5	ACAGTAAAGG TCTCCAGGT CGATGGGCGG ATCGATTGCG AGACCTTCT TGGTAACAAA	1737
	ACCTTTGCGA CGTCGTTCTG TGACGGGGCG GTCTTAGAGA CCAATGGCCC AGAGCGCCAC	1797
10	AATCTCTCCT TCGATGCCAG TCAGAGCACT ATGGCCGCTG GCCCTTTCAG TCTCACCTAT	1857
	GCCGCCTCTG CAGCTGGGCT GGAGGTGCGC TATGTTGCTG CCGGGCTTGA CCATCGGGCG	1917
	GTTTTTGCCC CCGGTGTTTC ACCCCGGTCA GCCCCGGCG AGGTTACCGC CTTCTGCTCT	1977
15	GCCCTATACA GGTTTAACCG TGAGGCCAG CGCCATTGCG TGATCGGTAA CTTATGGTTC	2037
	CATCCTGAGG GACTCATTGG CCTCTTCGCC CCGTTTTGCG CCGGGCATGT TTGGGAGTCG	2097
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	GCTGCCTCTT TTGTGATGCG CGACGGCGCG GCCGCGTACA CACTAACCCC CCGGCCAATA	2577
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40	TACCAGGTGC CGATCGGCC CAGTTTTGAC GCCTGGGAGC GGAACCACCG CCCCGGGAT	2757
	GAGTTGTACC TTCCTGAGCT TGCTGCCAGA TGGTTTGAGG CCAATAGGCC GACCCGCCCG	2817
45	ACTCTCACTA TAACTGAGGA TGTGACCG ACAGCGAATC TGGCCATCGA GCTTGACTCA	2877
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	CAGTTTACTG CAGGTGTGCC TGGATCCGGC AAGTCCCGCT CTATACCCA AGCCGATGTG	2997
50	GACGTTGTCG TGGTCCCGAC GCGTGAGTTG CGTAATGCCT GCGCCGCTG CGGCTTTGCT	3057
	GCTTTTACCC CGCATACTGC CGCCAGAGTC ACCCAGGGGC GCCGGGTTGT CATTGATGAG	3117
	GCTCCATCCC TCCCCCTCA CCTGCTGCTG CTCCACATGC AGCGGGCCGC CACCGTCCAC	3177
55	CTTCTTGGCG ACCCGAACCA GATCCGAGC ATCGACTTTG AGCACGCTGG GCTCGTCCCC	3237

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5	CGTTCGTTGT TCTGGGGTGA GCCTGCCGTC GGGCAGAAAC TAGTGTTTAC CCAGGCGGGC	3417
	AAGCCCGCCA ACCCCGGCTC AGTGACGGTC CACGAGGCGC AGGGCGCTAC CTACACGGAG	3477
10	ACCACTATTA TTGCCACAGC AGATGCCCGG GGCCTTATTC AGTCGTCTCG GGCTCATGCC	3537
	ATTGTTGCTC TGACGCGCCA CACTGAGAAG TGCATCATCA TTGACGCACC AGGCCTGCTT	3597
	CGCGAGGTGG GCATCTCCGA TGCAATCGTT AATAACTTTT TCCTCGCTGG TGGCGAAATT	3657
15	GGTCACCAGC GCCCATCAGT TATTCCCGT GGCAACCCTG ACGCCAATGT TGACACCCTG	3717
	GCTGCCTTCC CGCCGCTTG CCGATTAGT GCCTTCCATC AGTTGGCTGA GGAGCTTGGC	3777
20	CACAGACCTG TCCCTGTTGC AGCTGTTCTA CCACCCTGCC CCGAGCTCGA ACAGGGCCTT	3837
	CTCTACCTGC CCCAGGAGCT CACCACCTGT GATAGTGTG TAACATTTGA ATTAACAGAC	3897
	ATTGTGCACT GCCGCATGGC CGCCCCGAGC CAGCGCAAGG CCGTGCTGTC CACACTCGTG	3957
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30	CTAGTGGAGG CCATGGTCTGA GAAGGGCCAG GATGGCTCCG CCGTCCTTGA GCTTGATCTT	4137
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40	GCAAAGGCAT CCATGGTGTG TGAGAATGAC TTTTCTGAGT TTGACTCCAC CCAGAATAAC	4437
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	CGCCTGTATC ACCTTATAAG GTCTGCGTGG ATCTTGCAAG CCCGAAGGA GTCTCTGCGA	4557
45	GGGTTTTGGA AGAAACACTC CGGTGAGCCC GGCACCTTTC TATGGAATAC TGTCTGGAAT	4617
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50	GATGATTCGA TAGTGCTTTG CAGTGAGTAT CGTCAGAGTC CAGGAGCTGC TGTCTGATC	4737
	GCCGGCTGTG GCTTGAAGTT GAAGGTAGAT TTCCGCCCGA TCGGTTTGTA TGACAGTGTT	4797
	GTGGTGGCCC CCGGCCCTTG CGCGCTCCCT GATGTTGTGC GCTTCGCCGG CCGGCTTACC	4857
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	TTCCTCCGCA AGCTCACGAA TGTAGCTCAG ATGTGTGTGG ATGTTGTTTC CCGTGTTTAT	4977
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5	AAGGCACATT TCACTGAGTC AGTAAACCA GTGCTCGACT TGACAAATTC AATCTTGTGT	5097
	CGGGTGGAAT GA ATAACATGTC TTTTGCTGCG CCCATGGGTT CGCGACCATG	5149
10	CGCCCTCGGC CTATTTTGTT GCTGCTCCTC ATGTTTTTGC CTATGCTGCC CGCGCCACCG	5209
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25	GTCCGCTTTT ACCCCTTACG GACGGCACCA ATACCATAT AATGGCCACG GAAGCTTCTA	5687
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30	CTGTGCGCGG TTACGCCATC TCCATCTCAT TCTGGCCACA GACCACCACC ACCCGACGT	5807
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	CCTCTGAGCT TGTGATCCCA AGTGAGCGCC TACACTATCG TAACCAAGGC TGGCGCTCCG	5927
35	TCGAGACCTC TGGGGTGGCT GAGGAGGAGG CTACCTCTGG TCTTGTTATG CTTTGCATAC	5987
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40	ACTTTGCCCT TGAGCTTGAG TTTGCAACC TTACCCCGG TAACACCAAT ACGCGGGTCT	6107
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	TCACCACCAC GGCTGCTACC CGCTTTATGA AGGACCTCTA TTTTACTAGT ACTAATGGTG	6227
45	TCGGTGAGAT CGGCCGCGGG ATAGCCCTCA CCCTGTTCAA CCTTGCTGAC ACTCTGCTTG	6287
	GCGGCCTGCC GACAGAATTG ATTCGTCGG CTGGTGCCA GCTGTTCTAC TCCCGTCCCG	6347
50	TTGTCTCAGC CAATGGCGAG CCGACTGTTA AGTTGTATAC ATCTGTAGAG AATGCTCAGC	6407
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	AGGATTATGA TAACCAACAT GAACAAGATC GGCCGACGCC TTCTCCAGCC CCATCGCGCC	6527
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	ACCASTCCAC TTATGGCTCT TCGACTGGCC CAGTTTATGT TTCTGACTCT GTGACCTTGG	6647
5	TTAATGTTGC GACCGGCGCG CAGGCCGTTG CCCGGTCGCT CGATTGGACC AAGGTCACAC	6707
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15	TAGCCCCCA CTCTGCGCTA GCATTGCTTG AGGATACCTT GGACTACCCT GCCCGCGCCC	7007
	ATACTTTTGA TGATTCTGC CCAGAGTGCC GCCCCTTGG CTTTCAGGGC TGCCTTTCC	7067
	AGTCTACTGT CGCTGAGCTT CAGCGCCTTA AGATGAAGGT GGGTAAACT CGGGAGTTGT	7127
20	AG TTTATTGCT TGTGCCCCC TTCTTCTGT TGCTTATTC TCATTCTGC	7179
	GTTCCGCGCT CCCTGA	7195
	<b>a fourth sequence (SEQ ID NO.10):</b>	
25	GCCATGGAGG CCCACCAGTT CATTAAAGCT CCTGGCATCA CTAAGCTAT TGAGCAAGCA	60
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30	CATCAGCAGG TTGAGATCCT TATAAATCTC ATGCAACCTC GGCAGCTGGT GTTTCGTCT	180
	GAGGTTTTTT GGAATCACCC GATTCAACGT GTTATACATA ATGAGCTTGA GCAGTATTGC	240
	CGTGCTCGCT CGGGTCGCTG CTTGAGATT GGAGCCAC CACGCTCCAT TAATGATAAT	300
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	ACAGCCCCGA CTAGGGGACC TCGGGCGAAC TGTCGCCGCT CGGCACTTCG TGGTCTGCCA	420
40	CCAGCCGACC GCACTTACTG TTTTGATGGC TTTGCCGGCT GCCGTTTTGC CGCCGAGACT	480
	GGTGTGGCTC TCTATTCTCT CCATGACTTG CAGCCGGCTG ATGTTGCCGA GGCATGGCT	540
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50	ATCAGGACAA CTAAGGTTGT GGGTGAACAC CCTTTGGTGA TCGAGCGGGT GCGGGGTATT	780
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	CCTTACCCGC GTTCGACGGA GGTCTATGTC CGGTCTATCT TTGGGCCCGG CGGGTCCCCG	900
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	TGGGACCGTC TCATGCTCTT TGGGGCCACC CTCGACGACC AGGCCTTTTG CTGCTCCAGG	1020
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5	GAAGGCTGGA ATGCCACCGA GGATGCGCTC ACTGCAGTTA TTACGGCGGC TTACCTCACA	1140
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10	CGTGATTACA TCCCAGGCCG CCAGCTGCAG TTCTACGCTC AGTGCCGCCG CTGGTTATCT	1320
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15	CGAACCACCA TCCGGCGGAT CGCTGGA AAA TTTTGCTGTT TTATGAAGTG GCTCGGTCAG	1440
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	GAGGCCTATG AAGGCTCTGA TGTTGATACT GCTGAGCCTG CCACCCTAGA CATTACAGGC	1560
20	TCATACATCG TGGATGGTCG GTCTCTGCAA ACTGTCTATC AAGCTCTCGA CCTGCCAGCT	1620
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	AGTATGGCAG CCGGCCCGTT TTGCCTCACC TATGCTGCCG TAGATGGCGG GCTGGAAGTT	1860
30	CATTTTTCCA CCGCTGGCCT CGAGAGCCGT GTTGTTTTCC CCCCTGGTAA TGCCCCGACT	1920
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35	CAGCGCCAGT CGGTTATTGG TAGTTTGTGG CTGCACCCTG AAGGTTTGCT CGGCCTGTTC	2040
	CCGCCCTTTT CACCCGGGCA TGAGTGGCGG TCTGCTAACC CATTTTGCAG CGAGAGCACG	2100
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40	GGTCATTTGG ATGCTGCTCC CCACTCGGGG GGGCCACCTG CTAAGTCCAC AGGCCCTGCT	2220
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45	CCCTCTGGGG CCCGTCCGGC TGGCCCCAAC CCGAATGGCG TTCCGCAGCG CCGCTTACTA	2340
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50	TTTCAGCGTT ACCCTGATTC GTTTGACGCC ACCAAGTTTG TGATGCGTGA TGGTCTTGCC	2520
	GCGTATACCC TTACACCCCG GCCGATCATT CATGCGGTGG CCCCAGGACTA TCGATTGGAA	2580
55	CATAACCCCA AGAGGCTCGA GGCTGCCTAC CGCGAGACTT GCGCCCGCCG AGGCACTGCT	2640



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5	TTTGAATCCA ACCGCCCCGG TCAGCCCAGG TTGAACATAA CTGAGGATAC CGCCCGTGCG	2820
	GCCAACTGG CCCTGGAGCT TGACTCCGG AGTGAAGTAG GCCGCGCATG TGCCGGGTGT	2880
	AAAGTCGAGC CTGGCGTTGT GCGGTATCAG TTTACAGCCG GTGTCCCCGG CTCTGGCAAG	2940
10	TCAAAGTCCG TGCAACAGGC GGATGTGGAT GTTGTGTGTG TGCCCACTCG CGAGCTTCGG	3000
	AACGCTTGGC GGGCGCGGG CTTTGCGGCA TTTACTCCGC AACTGCGGC CGGTGTCACT	3060
15	AGCGGCCGTA GGGTTGTCAT TGATGAGGCC CCTTCGCTCC CCCCACTT GCTGCTTTTA	3120
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	GATTTTGAGC ACACCGGTCT GATTCCAGCA ATACGGCCGG AGTTGGTCCC GACTTCATGG	3240
20	TGGCATGTCA CCCACCGTTG CCCTGCAGAT GTCTGTGAGT TAGTCCGTGG TGCTTACCCT	3300
	AAAATCCAGA CTACAAGTAA GGTGCTCCGT TCCCTTTTCT GGGGAGAGCC AGCTGTCGGC	3360
25	CAGAAGCTAG TGTTACACA GGCTGCTAAG GCCGCGCACC CCGGATCTAT AACGGTCCAT	3420
	GAGGCCCAGG GTGCCACTTT TACCACTACA ACTATAATTG CAACTGCAGA TGCCCGTGGC	3480
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35	AACCTGACC GCAATGTTGA CGTGCTTGGC GCGTTTCAC CTTTCATGCCA AATAAGCGCC	3720
	TTCCATCAGC TTGCTGAGGA GCTGGGCCAC CGGCCGGCGC CGGTGGCGGC TGTGCTACCT	3780
	CCCTGCCCTG AGCTTGAGCA GGGCCTTCTC TATCTGCCAC AGGAGCTAGC CTCCTGTGAC	3840
40	AGTGTGTGA CATTTGAGCT AACTGACATT GTGCACTGCC GCATGGCGGC CCCTAGCCAA	3900
	AGGAAAGCTG TTTTGTCCAC GCTGGTAGGC CGGTATGGCA GACGCACAAG GCTTTATGAT	3960
45	GCGGGTCACA CCGATGTCCG CGCTCCCTT GCGCGCTTTA TTCCCACTCT CGGGCGGGTT	4020
	ACTGCCACCA CCTGTGAAC TTTGAGCTT GTAGAGGCGA TGGTGGAGAA GGGCCAAGAC	4080
	GGTTCAGCCG TCCTCGAGTT GGATTTGTGC AGCCGAGATG TCTCCCGCAT AACCTTTTTC	4140
50	CAGAAGGATT GTAACAAGTT CACGACCGGC GAGACAATTG CGCATGGCAA AGTCGGTCAG	4200
	GGTATCTTCC GCTGGAGTAA GACGTTTTGT GCCCTGTTG GCCCTGGTT CCGTGCGATT	4260
55	GAGAAGGCTA TTCTATCCCT TTTACCACAA GCTGTGTTCT ACGGGGATGC TTATGACGAC	4320

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	TCAGTATTCT CTGCTGCCGT GGCTGGCGCC AGCCATGCCA TGGTGTGTTGA AAATGATTTT	4380
	TCTGAGTTTG ACTCGACTCA GAATAACTTT TCCCTAGGTC TTGAGTGCGC CATTATGGAA	4440
5	GAGTGTGGTA TGCCCCAGTG GCTTGTCAAGG TTGTACCATG CCGTCCGGTC GGCCTGGATC	4500
	CTGCAGGCCC CAAAAGAGTC TTTGAGAGGG TTCTGGAAGA AGCATTCTGG TGAGCCGGGC	4560
	AGCTTGCTCT GGAATACGGT GTGGAACATG GCAATCATTG CCCATTGCTA TGAGTTCCGG	4620
10	GACCTCCAGG TTGCCGCCTT CAAGGGCGAC GACTCGGTCG TCCTCTGTAG TGAATACCGC	4680
	CAGAGCCCAG GCGCCGGTTC GCTTATAGCA GGCTGTGGTT TGAAGTTGAA GGCTGACTTC	4740
15	CGGCCGATTG GGCTGTATGC CGGGTTGTC GTCGCCCCGG GGCTCGGGGC CCTACCCGAT	4800
	GTCGTTGAT TCGCCGGACG GCTTTCGGAG AAGAACTGGG GGCCTGATCC GGAGCGGGCA	4860
	GAGCAGCTCC GCCTCGCCGT GCAGGATTTT CTCCGTAGGT TAACGAATGT GGCCAGATT	4920
20	TGTGTTGAGG TGGTGTCTAG AGTTTACGGG GTTCCCCGG GTCTGGTTCA TAACCTGATA	4980
	GGCATGCTCC AGACTATTGG TGATGGTAAG GCGCATTTTA CAGAGTCTGT TAAGCCTATA	5040
25	CTTGACCTTA CAACTCAAT TATGCACCGG TCTGAATGAA TAACATGTGG TTTGCTGCGC	5100
	CCATGGGTTT GCCACCATGC GCCCTAGGCC TCTTTTGCTG TTGTTCTCT TGTTCCTGCC	5160
	TATGTTGCCC GCGCCACCGA CCGGTACGCC GTCTGGCCGC CGTCGTGGGC GGCACGCGG	5220
30	CGGTACCGGC GGTGTTTCT GGGGTGACCG GGTGATTCT CAGCCCTTCG CAATCCCCTA	5280
	TATTCATCCA ACCAACCCTT TTGCCCCAGA CGTTGCCGCT GCGTCCGGGT CTGGACCTCG	5340
35	CCTTCGCCAA CCAGCCCGGC CACTTGGCTC CACTTGGCGA GATCAGGCC AGCGCCCTC	5400
	CGCTGCCTCC CGTCGCCGAC CTGCCACAGC CGGGGCTGCG GCGCTGACGG CTGTGGCGCC	5460
40	TGCCCATGAC ACCTCACCGG TCCCGGACGT TGATTCTCGC GGTGCAATTC TACGCCCCA	5520
	GTATAATTG TCTACTTCAC CCCTGACATC CTCTGTGGCC TCTGGCACTA ATTTAGTCCT	5580
	GTATGCAGCC CCCCTTAATC CGCCTCTGCC GCTGCAGGAC GGTACTAATA CTCACATTAT	5640
45	GGCCACAGAG GCCTCCAATT ATGCACAGTA CCGGGTTGCC CGCGCTACTA TCCGTTACCG	5700
	GCCCCTAGTG CCTAATGCAG TTGGAGGCTA TGCTATATCC ATTTCTTTCT GGCCTCAAAC	5760
50	AACCACAACC CCTACATCTG TTGACATGAA TTCCATTACT TCCACTGATG TCAGGATTCT	5820
	TGTTCAACCT GGCATAGCAT CTGAATTGGT CATCCCAAGC GAGCGCCTTC ACTACGCAA	5880
	TCAAGGTTGG CGCTCGGTTG AGACATCTGG TGTGCTGAG GAGGAAGCCA CCTCCGGTCT	5940
55	TGTCATGTTA TGCATACATG GCTCTCCAGT TAACTCCTAT ACCAATACCC CTTATACCGG	6000

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5 TGCCCTTGGC TTACTGGACT TTGCCTTAGA GCTTGAGTTT CGCAATCTCA CCACCTGTAA 6060  
CACCAATACA CGTGTGTCCC GTTACTCCAG CACTGCTCGT CACTCCGCCC GAGGGGCCGA 6120  
CGGGACTGCG GAGCTGACCA CAACTGCAGC CACCAGGTTT ATGAAAGATC TCCACTTTAC 6180  
CGGCCTTAAT GGGGTAGGTG AAGTCGGCCG CGGGATAGCT CTAACATTAC TTAACCTTGC 6240  
10 TGACACGCTC CTCGGCGGGC TCCCGACAGA ATTAATTTCTG TCGGCTGGCG GGCAACTGTT 6300  
TTATTCCCGC CCGTTGTCT CAGCCAATGG CGAGCCAACC GTGAAGCTCT ATACATCAGT 6360  
GGAGAATGCT CAGCAGGATA AGGGTGTGTC TATCCCCAC GATATCGATC TTGGTGATTC 6420  
15 GCGTGTGGTC ATTCAGGATT ATGACAACCA GCATGAGCAG GATCGGCCCA CCCCCTCGCC 6480  
TGCGCCATCT CGGCCTTTTT CTGTTCTCCG AGCAAATGAT GTACTTTGGC TGTCCCTCAC 6540  
TGCAGCCGAG TATGACCAGT CCACTTACGG GTCGTCAACT GGCCCGGTTT ATATCTCGGA 6600  
20 CAGCGTGACT TTGGTGAATG TTGCGACTGG CGCGCAGGCC GTAGCCCGAT CGCTTGACTG 6660  
GTCCAAAGTC ACCCTCGACG GCGGGCCCT CCCGACTGTT GAGCAATATT CCAAGACATT 6720  
25 CTTTGTGCTC CCCCTTCGTG GCAAGCTCTC CTTTGGGAG GCCGGCACAA CAAAAGCAGG 6780  
TTATCCTTAT AATTATAATA CTACTGCTAG TGACCAGATT CTGATTGAAA ATGCTGCCGG 6840  
CCATCGGGTC GCCATTTCAA CCTATACCAC CAGGCTTGGG GCCGGTCCGG TCGCCATTTT 6900  
30 TGCGGCCGCG GTTTTGGCTC CACGCTCCGC CCTGGCTCTG CTGGAGGATA CTTTGTATTA 6960  
TCCGGGGCGG GCGCACACAT TTGATGACTT CTGCCCTGAA TGCCGCGCTT TAGGCCTCCA 7020  
35 GGGTTGTGCT TTCCAGTCAA CTGTCGCTGA GCTCCAGCGC CTAAAGTTA AGGTGGGTAA 7080  
AACTCGGGAG TTGTAGTTTA TTTGGCTGTG CCCACCTACT TATATCTGCT GATTTCTTT 7140  
ATTTCTTTT TCTCGGTCCC GCGCTCCCTG A 7171  
40

or a fifth sequence (SEQ ID NO.12):

CGGGCCCCGT ACAGGTCACA ACCTGTGAGT TGTACGAGCT AGTGGAGGCC ATGGTCGAGA 60  
AAGGCCAGGA TGGCTCCGCC GTCCTTGAGC TCGATCTCTG CAACCGTGAC GTGTCCAGGA 120  
45 TCACCTTTTT CCAGAAAGAT TGCAATAAGT TCACCACGGG AGAGACCATC GCCCATGGTA 180  
AAGTGGGCCA GGGCATTTCTG GCCTGGAGTA AGACCTTCTG TGCCCTTTTC GGCCCTGGT 240  
50 TCCGTGCTAT TGAGAAGGCT ATTCTGGCCC TGCTCCCTCA GGGTGTGTTT TATGGGGATG 300  
CCTTTGATGA CACCGTCTTC TCGGCGCGTG TGGCCGAGC AAAGGCGTCC ATGGTGTGTTG 360  
AGAATGACTT TTCTGAGTTT GACTCCACCC AGAATAATTT TTCCCTGGGC CTAGAGTGTG 420  
55 CTATTATGGA GAAGTGTGGG ATGCCGAAGT GGCTCATCCG CTTGTACCAC CTTATAAGGT 480

CTGCGTGGAT CCTGCAGGCC CCGAAGGAGT CCCTGCGAGG GTGTTGGAAG AAACACTCCG 540  
 GTGAGCCCGG CACTCTTCTA TGAATACTG TCTGGAACAT GGCCGTTATC ACCCATTGTT 600  
 5 ACGATTTCGG CGATTTCAG GTGGCTGCCT TTAAGGTGA TGATTGATA GTGCTTTGCA 660  
 GTGAGTACCG TCAGAGTCCA GGGGCTGCTG TCCTGATTGC TGGCTGTGGC TTAAGCTGA 720  
 10 AGGTGGGTTT CCGTCCGATT GGTGTGATG CAGGTGTTGT GGTGACCCCC GGCCTTGGCG 780  
 CGCTTCCGA CGTCGTGCGC TTGTCCGGCC GGCTTACTGA GAAGAATTGG GGCCTTGGCC 840  
 CTGAGCGGGC GGAGCAGCTC CGCCTTGCTG TGGC 874

15  
 or a sequence complementary thereto.

20 4. A protein which is (a) immunoreactive with antibodies present in individuals infected with enterically transmitted nonA/nonB hepatitis and (b) derived from a viral hepatitis agent whose genome contains a region which is homologous to the 1.33 kb DNA EcoRI insert present in plasmid pTZXF1(ET1.1) carried in E. coli strain BB4, and having ATCC  
 25 Deposit Nno. 67717.

5. The protein of claim 4, which is encoded by a coding region within said 1.33 kb EcoRI insert.

30 6. A protein which is (a) immunoreactive with antibodies present in individuals infected with enterically transmitted nonA/nonB hepatitis and (b) encoded by genetic sequence 406.3-2 or 406.4-2 or a fragment thereof.

35

7. A method of detecting infection by enterically transmitted nonA/nonB hepatitis viral agent in a test individual, comprising:

40 providing a peptide antigen which is (a) immunoreactive with antibodies present in individuals infected with enterically transmitted nonA/nonB hepatitis and (b) derived from a viral hepatitis agent whose genome contains a region which is homologous to

the 1.33 kb DNA EcoRI insert present in plasmid  
pTZKF1(ET1.1) carried in E. coli strain BB4, and  
having ATCC deposit no. 67717,

5 reacting serum from the test individual with  
such antigen, and

examining the antigen for the presence of  
bound antibody.

10 8. The method of claim 7, wherein the serum  
antibody is an IgM or IgG antibody, or a mixture of  
both, the antigen provided is attached to a support,  
said reacting includes contacting such serum with the  
support and said examining includes reacting the  
15 support and bound serum antibody with a reporter-  
labeled anti-human antibody.

20 9. A kit for ascertaining the presence of serum  
antibodies which are diagnostic of enterically  
transmitted nonA/nonB hepatitis infection, comprising  
a support with surface-bound recombinant  
peptide antigen which is (a) immunoreactive with  
antibodies present in individuals infected with  
enterically transmitted nonA/nonB viral hepatitis  
agent and (b) derived from a viral hepatitis agent  
25 whose genome contains a region which is homologous to  
the 1.33 kb DNA EcoRI insert present in plasmid  
pTZKF1(ET1.1) carried in E. coli strain BB4, and  
having ATCC deposit no. 67717, and  
a reporter-labeled anti-human antibody.

30 10. A DNA fragment derived from an enterically  
transmitted nonA/nonB viral hepatitis agent whose  
genome contains a region which is homologous to the  
1.33 kb DNA EcoRI insert present in plasmid  
35 pTZKF1(ET1.1) carried in E. coli strain BB4 and having  
ATCC deposit no. 67717.

11. The fragment of claim 10, which is derived from said 1.33 kb EcoRI insert.

5 12. A DNA molecule comprising genetic sequence 406.3-2 or 406.4-2 or a fragment thereof, wherein said fragment comprises at least 12 consecutive nucleotides.

10 13. A DNA fragment derived from an enterically transmitted nonA/nonB viral hepatitis agent whose genome contains a region which is homologous to a DNA fragment within a first sequence (SEQ ID NO.1):

AGACCTGTCC CTGTTGCAGC TGTTCTACCA CCCTGCCCCG AGCTCGAACA GGGCCTTCTC 60  
15 TACCTGCCCC AGGAGCTCAC CACCTGTGAT AGTGTCTGTA CATTGAATT AACAGACATT 120  
GTGCACTGCC GCATGGCCGC CCCGAGCCAG CGCAAGGCCG TGCTGTCCAC ACTCGTGGGC 180  
CGCTACGGCG GTCGCACAAA GCTCTACAAT GCTTCCCACT CTGATGTTCTG CGACTCTCTC 240  
20 GCCCGTTTTA TCCCGGCCAT TGGCCCCGTA CAGGTTACAA CTTGTGAATT GTACGAGCTA 300  
GTGGAGGCCA TGGTCGAGAA GGGCCAGGAT GGCTCCGCCG TCCTTGAGCT TGATCTTTGC 360  
25 AACCGTGACG TGTCAGGAT CACCTTCTTC CAGAAAGATT GTAACAAGTT CACCACAGGT 420  
GAGACCATTG CCCATGGTAA AGTGGGCCAG GGCATCTCGG CCTGGAGCAA GACCTTCTGC 480  
GCCCTCTTTG GCCCTTGTTT CCGCGCTATT GAGAAGGCTA TTCTGGCCCT GCTCCCTCAG 540  
30 GGTGTGTTTT ACGGTGATGC CTTTGATGAC ACCGTCTTCT CGGCGGCTGT GGCCGCAGCA 600  
AAGGCATCCA TGGTGTGTTGA GAATGACTTT TCTGAGTTTG ACTCCACCCA GAATACTTT 660  
35 TCTCTGGGTC TAGAGTGTGC TATTATGGAG GAGTGTGGGA TGCCGCAGTG GCTCATCCGC 720  
CTGTATCACC TTATAAGGTC TGCCTGGATC TTGCAGGCCG CGAAGGAGTC TCTGCGAGGG 780  
TTTTGGAAGA AACACTCCGG TGAGCCCGGC ACTCTTCTAT GGAATACTGT CTGGAATATG 840  
40 GCCGTTATTA CCCACTGTTA TGACTTCCGC GATTTTCAGG TGGCTGCCTT TAAAGGTGAT 900  
GATTGATAG TGCTTTGCAG TGAGTATCGT CAGAGTCCAG GAGCTGCTGT CCTGATCGCC 960  
45 GGCTGTGGCT TGAAGTTGAA GGTAGATTTC CGCCCGATCG GTTTGTATGC AGGTGTTGTG 1020  
GTGGCCCCCG GCCTTGGCGC GCTCCCTGAT GTTGTGCGCT TCGCCGGCCG GCTTACCGAG 1080  
AAGAATTGGG GCCCTGGCCC TGAGCGGGCG GAGCAGCTCC GCCTCGCTGT TAGTGATTTC 1140

	CTCCGCAAGC TCACGAATGT AGCTCAGATG TGTGTGGATG TTGTTTCCCG TGTATTATGGG	1200
	GTTTCCCCTG GACTCGTTCA TAACCTGATT GGCATGCTAC AGGCTGTTGC TGATGGCAAG	1260
5	GCACATTTC A CTGAGTCAGT AAAACCAAGT CTCGA	1295
	a second sequence (SEQ ID NO.5):	
	TCGAGCACTG GTTTTACTGA CTCAGTGAAA TGTGCCTTGC CATCAGCAAC AGCCTGTAGC	60
10	ATGCCAATCA GGTATGAAC GAGTCCAGGG GAAACCCCAT AAACACGGGA AACACATCC	120
	ACACACATCT GAGCTACATT CGTGAGCTTG CGGAGGAAAT CACTAACAGC GAGGCGGAGC	180
	TGCTCCGCCC GCTCAGGGCC AGGGCCCCAA TTCTTCTCGG TAAGCCGGCC GGCGAAGCGC	240
15	ACAACATCAG GGAGCGCGCC AAGGCCGGGG GCCACCACAA CACCTGCATA CAAACCGATC	300
	GGGCGGAAAT CTACCTTCAA CTTCAAGCCA CAGCCGGCGA TCAGGACAGC AGCTCCTGGA	360
20	CTCTGACGAT ACTCACTGCA AAGCACTATC GAATCATCAC CTTTAAAGGC AGCCACCTGA	420
	AAATCGCGGA AGTCATAACA GTGGGTAATA ACGGCCATAT TCCAGACAGT ATTCCATAGA	480
	AGAGTGCCGG GCTCACCAGA GTGTTTCTTC CAAAACCTC GCAGAGACTC CTTGCGGGCC	540
25	TGCAAGATCC ACGCAGACCT TATAAGGTGA TACAGGCGGA TGAGCCACTG CGGCATCCCA	600
	CACTCCTCCA TAATAGCACA CTCTAGACCC AGAGAAAAGT TATTCTGGGT GGAGTCAAAC	660
30	TCAGAAAAGT CATTCTCAA CACCATGGAT GCCTTTGCTG CGGCCACAGC CGCCGAGAAG	720
	ACGGTGTCAT CAAAGGCATC ACCGTAAAC ACACCCTGAG GGAGCAGGGC CAGAATAGCC	780
	TTCTCAATAG CGCGGAACCA AGGGCCAAAG AGGGCGCAGA AGGTCTTGCT CCAGGCCGAG	840
35	ATGCCCTGGC CCACTTTACC ATGGGCAATG GTCTCACCTG TGGTGAACCT GTTACAATCT	900
	TTCTGGAAGA AGGTGATCCT GGACACGTCA CGGTTGCAA GATCAAGCTC AAGGACGGCG	960
40	GAGCCATCCT GGCCCTTCTC GACCATGGCC TCCACTAGCT CGTACAATC ACAAGTTGTA	1020
	ACCTGTACGG GGCCAATGGC CGGGATAAAA CGGGCGAGAG AGTCGCGAAC ATCAGAGTGG	1080
	GAAGCATTGT AGAGCTTTGT GCGACCGCCG TAGCGGCCCA CGAGTGTGGA CAGCACGGCC	1140
45	TTGCGCTGGC TCGGGGCGGC CATGCGGCAG TGCACAATGT CTGTTAATC AAATGTTACG	1200
	AACTATCAC AGGTGGTGAG CTCCTGGGGC AGGTAGAGAA GGCCCTGTTC GAGCTCGGGG	1260
50	CAGGGTGGTA GAACAGCTGC AACAGGGACA GGTCT	1295
	a third sequence (SEQ ID NO.6):	
	AGGCAGACCA CATATGTGGT CGATGCC ATGGAGGCCC ATCAGTTTAT TAAGGCTCCT	57
55	GGCATCACTA CTGCTATTGA GCAGGCTGCT CTAGCAGCGG CCAACTCTGC CCTGGCGAAT	117

	GCTGTGGTAG TTAGGCCTTT TCTCTCTCAC CAGCAGATTG AGATCCTCAT TAACCTAATG	177
5	CAACCTCGCC AGCTTGTTTT CCGCCCCGAG GTTTTCTGGA ATCATCCCAT CCAGCGTGTC	237
	ATCCATAACG AGCTGGAGCT TTA CTGCGC GCGCGCTCCG GCCGCTGTCT TGAAATTGGC	297
	GCCCATCCCC GCTCAATAAA TGATAATCCT AATGTGGTCC ACCGCTGCTT CCTCCGCCCT	357
10	GTTGGGCGTG ATGTTCAAGC CTGGTATACT GCTCCCACTC GCGGGCCGGC TGCTAATTGC	417
	CGGCGTTCCG CGCTGCGCGG GCTTCCCGCT GCTGACCGCA CTTACTGCCT CGACGGGTTT	477
	TCTGGCTGTA ACTTTCCCGC CGAGACTGGC ATCGCCCTCT ACTCCCTTCA TGATATGTCA	537
15	CCATCTGATG TCGCCGAGGC CATGTTCCGC CATGGTATGA CGCGGCTCTA TGCCGCCCTC	597
	CATCTTCCGC CTGAGGTCCT GCTGCCCCCT GGCACATATC GCACCGCATC GTATTTGCTA	657
20	ATTCATGACG GTAGGCGCGT TGTGGTGACG TATGAGGGTG AACTAGTGC TGTTTACAAC	717
	CACGATGTCT CCAACTTGCG CTCCTGGATT AGAACCACCA AGGTTACCGG AGACCATCCC	777
	CTCGTTATCG AGCGGGTTAG GGCCATTGGC TGCCACTTTG TTCTCTTGCT CACGGCAGCC	837
25	CCGAGCCAT CACCTATGCC TTATGTTCTT TACCCCGGT CTACCGAGGT CTATGTCCGA	897
	TGATCTTCG GCCCGGGTGG CACCCCTTCC TTATTCCAA CCTCATGCTC CACTAAGTCG	957
30	ACCTTCCATG CTGTCCCTGC CCATATTTGG GACCGTCTTA TGCTGTTCCG GGCCACCTTG	1017
	GATGACCAAG CCTTTTGCTG CTCCCGTTTA ATGACCTACC TTCGCGGCAT TAGCTACAAG	1077
	GCTACTGTTG GTACCTTGT GGCTAATGAA GGCTGGAATG CCTCTGAGGA CGCCCTCACA	1137
35	GCTGTTATCA CTGCCGCTA CCTTACCATT TGCCACCAGC GGTATCTCCG CACCCAGGCT	1197
	ATATCCAAGG GGATGCGTCG TCTGGAACGG GAGCATGCCC AGAAGTTTAT AACACGCCTC	1257
40	TACAGCTGGC TCTTCGAGAA GTCCGGCCGT GATTACATCC CTGGCCGTCA GTTGGAGTTC	1317
	TACGCCCAGT GCAGGCGCTG GCTCTCCGCC GGCTTTCATC TTGATCCACG GGTGTTGGTT	1377
	TTTGACGAGT CGGCCCCCTG CCATTGTAGG ACCGCGATCC GTAAGGCGCT CTCAAAGTTT	1437
45	TGCTGCTTCA TGAAGTGGCT TGGTCAGGAG TGCACCTGCT TCCTTCAGCC TGCAGAAGGC	1497
	GCCGTCGGCG ACCAGGGTCA TGATAATGAA GCCTATGAGG GGTCCGATGT TGACCCTGCT	1557
50	GAGTCGCCA TTAGTGACAT ATCTGGGTCC TATGTCGTCC CTGGCACTGC CCTCCAACCG	1617
	CTCTACCAGG CCCTCGATCT CCCCCTGAG ATTGTGGCTC GCGCGGGCCG GCTGACCGCC	1677
	ACAGTAAAGG TCTCCAGGT CGATGGGCGG ATCGATTGCG AGACCCTTCT TGTAACAAA	1737
55	ACCTTTCGCA CGTCGTTCTG TGACGGGGCG GTCTTAGAGA CCAATGGCCC AGAGCGCCAC	1797



	AATCTCTCCT TCGATGCCAG TCAGAGCACT ATGGCCGCTG GCCCTTTCAG TCTCACCTAT	1857
	GCCGCCTCTG CAGCTGGGCT GGAGGTGCGC TATGTTGCTG CCGGGCTTGA CCATCGGGCG	1917
5	GTTTTTGCCC CCGGTGTTTC ACCCCGGTCA GCCCCCGGCG AGGTTACCGC CTTCTGCTCT	1977
	GCCCTATACA GGTTTAACCG TGAGGCCAG CGCCATTGCG TGATCGGTAA CTTATGGTTC	2037
10	CATCCTGAGG GACTCATTGG CCTCTTCGCC CCGTTTTGCG CCGGGCATGT TTGGGAGTCG	2097
	GCTAATCCAT TCTGTGGCGA GAGCACACTT TACACCCGTA CTTGGTCGGA GGTTGATGCC	2157
	GTCTCTAGTC CAGCCCGGCC TGACTTAGGT TTTATGTCTG AGCCTTCTAT ACCTAGTAGG	2217
15	GCCGCCACGC CTACCCTGGC GGCCCTCTA CCCCCCCTG CACCGGACCC TTCCCCCCT	2277
	CCCTCTGCCC CGGCGCTTGC TGAGCCGGCT TCTGGCGCTA CCGCCGGGGC CCCGGCCATA	2337
20	ACTCACCAGA CGGCCCGGCA CCGCCGCTG CTCTTCACCT ACCCGGATGG CTCTAAGGTA	2397
	TTGCGCGGCT CGCTGTTGGA GTCGACATGC ACGTGGCTCG TTAACGCGTC TAATGTTGAC	2457
	CACCGCCCTG GCGGCGGGCT TTGCCATGCA TTTTACCAA GGTACCCCGC CTCCTTTGAT	2517
25	GCTGCTCTT TTGTGATGCG CGACGGCGCG GCCGCGTACA CACTAACCCC CCGGCCAATA	2577
	ATTCACGCTG TCGCCCTGA TTATAGGTTG GAACATAACC CAAAGAGGCT TGAGGCTGCT	2637
30	TATCGGGAAA CTTGCTCCCG CCTCGGCACC GCTGCATACC CGCTCCTCGG GACCGGCATA	2697
	TACCAGGTGC CGATCGGCCC CAGTTTTGAC GCCTGGGAGC GGAACCACCG CCCCGGGGAT	2757
	GAGTTGTACC TTCCTGAGCT TGCTGCCAGA TGGTTTGAGG CCAATAGGCC GACCCGCCCC	2817
35	ACTCTCACTA TAACTGAGGA TGTTGCACGG ACAGCGAATC TGGCCATCGA GCTTGACTCA	2877
	GCCACAGATG TCGGCCGGGC CTGTGCCGGC TGTCGGGTCA CCCCCGGCGT TGTTCAGTAC	2937
40	CAGTTTACTG CAGGTGTGCC TGGATCCGGC AAGTCCCGCT CTATACCCA AGCCGATGTG	2997
	GACGTTGTG TGGTCCCGAC GCGTGAGTTG CGTAATGCCT GGCGCCGTG CGGCTTTGCT	3057
	GCTTTTACCC CGCATACTGC CGCCAGAGTC ACCCAGGGGC GCCGGGTTGT CATTGATGAG	3117
45	GCTCCATCCC TCCCCCTCA CCTGTGCTG CTCCACATGC AGCGGGCCGC CACCGTCCAC	3177
	CTTCTTGCG ACCCGAACCA GATCCAGCC ATCGACTTTG AGCACGCTGG GCTCGTCCCC	3237
50	GCCATCAGGC CCGACTTAGG CCCACCTCC TGGTGGCATG TTACCCATCG CTGGCCTGCG	3297
	GATGTATGCG AGCTCATCCG TGGTGCATAC CCCATGATCC AGACCACTAG CCGGGTTCTC	3357
	CGTTCGTTGT TCTGGGGTGA GCCTGCCGTC GGGCAGAAAC TAGTGTTAC CCAGGCGGCC	3417
55	AAGCCCGCCA ACCCGGCTC AGTGACGGTC CACGAGGCGC AGGCGCTAC CTACACGGAG	3477

	ACCACTATTA TTGCCACAGC AGATGCCCGG GGCCTTATTC AGTCGTCTCG GGCTCATGCC	3537
5	ATTGTTGCTC TGACGCGCCA CACTGAGAAG TCGTCATCA TTGACGCACC AGGCCTGCTT	3597
	CGCGAGGTGG GCATCTCCGA TGCAATCGTT AATAACTTTT TCCTCGCTGG TGGCGAAATT	3657
	GGTCACCAGC GCCCATCAGT TATTCCCCGT GGCAACCCTG ACGCCAATGT TGACACCCTG	3717
10	GCTGCCTTCC CGCGTCTTG CCAGATTAGT GCCTTCCATC AGTTGGCTGA GGAGCTTGGC	3777
	CACAGACCTG TCCCTGTTGC AGCTGTTCTA CCACCCTGCC CCGAGCTCGA ACAGGGCCTT	3837
	CTCTACCTGC CCCAGGAGCT CACCACCTGT GATAGTGTG TAACATTTGA ATTAACAGAC	3897
15	ATTGTGCACT GCCGCATGGC CGCCCCGAGC CAGCGCAAGG CCGTGCTGTC CACACTCGTG	3957
	GGCCGCTACG GCGGTCGCAC AAAGCTCTAC AATGCTTCCC ACTCTGATGT TCGCGACTCT	4017
20	CTCGCCCGTT TTATCCCGGC CATTGGCCCC GTACAGGTGA CAACTTGTGA ATTGTACGAG	4077
	CTAGTGGAGG CCATGGTCGA GAAGGGCCAG GATGGCTCCG CCGTCCTTGA GCTTGATCTT	4137
	TGCAACCGTG ACGTGTCCAG GATCACCTTC TTCCAGAAAG ATTGTAACAA GTTACCACA	4197
25	GGTGAGACCA TTGCCATGG TAAAGTGGGC CAGGGCATCT CGGCCTGGAG CAAGACCTTC	4257
	TGCGCCCTCT TTGGCCCTTG GTTCCGCGCT ATTGAGAAGG CTATTCTGGC CCTGCTCCCT	4317
30	CAGGGTGTGT TTTACGGTGA TGCCCTTGAT GACACCGTCT TCTCGGCGGC TGTGGCCGCA	4377
	GCAAAGGCAT CCATGGTGTT TGAGAATGAC TTTTCTGAGT TTGACTCCAC CCAGAATAAC	4437
	TTTTCTCTGG GTCTAGAGTG TGCTATTATG GAGGAGTGTG GGATGCCGCA GTGGCTCATC	4497
35	CGCCTGTATC ACCTTATAAG GTCTGCGTGG ATCTTGCAAG CCCCAGGA GTCTCTGCGA	4557
	GGGTTTTGGA AGAAACACTC CGGTGAGCCC GGCACCTTC TATGGAATAC TGTCTGGAAT	4617
40	ATGGCCGTTA TTACCCACTG TTATGACTTC CGCGATTTTC AGGTGGCTGC CTTTAAAGGT	4677
	GATGATTCGA TAGTGCTTTG CAGTGAGTAT CGTCAGAGTC CAGGAGCTGC TGTCTGATC	4737
	GCCGGCTGTG GCTTGAAGTT GAAGGTAGAT TTCCGCCCCA TCGGTTTGTA TGCAGGTGTT	4797
45	GTGGTGGCCC CCGGCCTTGG CGCGCTCCCT GATGTTGTGC GCTTCGCCGG CCGGCTTACC	4857
	GAGAAGAATT GGGGCCCTGG CCCTGAGCGG GCGGAGCAGC TCCGCCTCGC TGTTAGTGAT	4917
50	TTCTCCGCA AGCTCACGAA TGTAGCTCAG ATGTGTGTGG ATGTTGTTTC CCGTGTATAT	4977
	GGGGTTTCCC CTGGACTCGT TCATAACCTG ATTGGCATGC TACAGGCTGT TGCTGATGGC	5037
	AAGGCACATT TCACTGAGTC AGTAAACCA GTGCTCGACT TGACAAATTC AATCTTGTGT	5097
55	CGGGTGAAT GA ATAACATGTC TTTTGCTGCG CCCATGGGTT CGCGACCATG	5149

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	CGCCCTCGGC CTATTTTGT GCTGCTCTC ATGTTTTTGC CTATGCTGCC CGCGCCACCG	5209
5	CCCAGTCAGC CGTCTGGCCG CCGTCGTGGG CGGCGCAGCG GCGGTTCCGG CGGTGGTTTC	5269
	TGGGGTGACC GGGTTGATTC TCAGCCCTTC GCAATCCCCT ATATTCATCC AACCAACCCC	5329
	TTCGCCCCCG ATGTCACCGC TCGGCGCGGG GCTGGACCTC GTGTTGCCA ACCCGCCGA	5389
10	CCACTCGGCT CCGCTTGGCG TGACCAGGCC CAGCGCCCCG CCGTTGCCTC ACGTCGTAGA	5449
	CCTACCACAG CTGGGGCCGC GCCGCTAA CCGCGGTCGC TCCGGCCCAT GACACCCCGC	5507
15	CAGTGCCTGA TGTCGACTCC CGCGGCGCCA TCTTGCCTG GCAGTATAAC CTATCAACAT	5567
	CTCCCTTAC CTCTTCGTG GCCACCGGCA CTAACCTGGT TCTTTATGCC GCCCTCTTA	5627
	GTCCGCTTTT ACCCCTTCAG GACGGCACCA ATACCCATAT AATGGCCACG GAAGCTTCTA	5687
20	ATTATGCCCA GTACCGGGT GCCCGTGCCA CAATCCGTTA CCGCCCGCTG GTCCCAATG	5747
	CTGTCGGCGG TTACGCCATC TCCATCTCAT TCTGGCCACA GACCACCACC ACCCGACGT	5807
25	CCGTTGATAT GAATCAATA ACCTCGACGG ATGTTGAT TTAGTCCAG CCCGGCATAG	5867
	CCTCTGAGCT TGTGATCCA AGTGAGCGCC TACACTATCG TAACCAAGGC TGGCGCTCCG	5927
	TCGAGACCTC TGGGGTGGCT GAGGAGGAGG CTACCTCTGG TCTTGTTATG CTTTGCATAC	5987
30	ATGGCTCACT CGTAAATTCC TATACTAATA CACCCTATAC CGGTGCCCTC GGGCTGTTGG	6047
	ACTTTGCCCT TGAGCTTGAG TTTGCAACC TTACCCCGG TAACACCAAT ACGCGGGTCT	6107
35	CCCGTTATTC CAGCACTGCT CGCCACCGCC TTCGTCGCGG TCGGACGGG ACTGCCGAGC	6167
	TCACCACCAC GGCTGCTACC CGCTTTATGA AGGACCTCTA TTTTACTAGT ACTAATGGTG	6227
	TCGGTGAGAT CGGCCGCGGG ATAGCCCTCA CCCTGTTCAA CTTGCTGAC ACTCTGCTTG	6287
40	GCGGCCTGCC GACAGAATTG ATTTGTCGG CTGGTGCCA GCTGTTCTAC TCCGTCCCG	6347
	TTGTCTCAGC CAATGGCGAG CCGACTGTTA AGTTGTATAC ATCTGTAGAG AATGCTCAGC	6407
45	AGGATAAGGG TATTGCAATC CCGCATGACA TTGACCTCGG AGAATCTCGT GTGGTTATTC	6467
	AGGATTATGA TAACCAACAT GAACAAGATC GGCCGACGCC TTCTCCAGCC CCATCGCGCC	6527
	CTTTCTCTGT CCTTCGAGCT AATGATGTGC TTTGGCTCTC TCTACCGCT GCCGAGTAG	6587
50	ACCAGTCCAC TTATGGCTCT TCGACTGGCC CAGTTTATGT TTCTGACTCT GTGACCTTGG	6647
	TTAATGTTGC GACCGGCGCG CAGGCCGTTG CCCGGTCGCT CGATTGGACC AAGGTCACAC	6707
55	TTGACGGTCG CCCCCTCTCC ACCATCCAGC AGTACTCGAA GACCTTCTTT GTCCTGCCGC	6767
	TCCGCGGTAA GCTCTCTTTC TGGGAGGAG GCACAATAA AGCCGGGTAC CCTTATAATT	6827

5  
10  
15

ATAACACCAC TGCTAGCGAC CAACTGCTTG TCGAGAATGC CGCCGGGCAC CGGGTCGCTA	6887
TTTCCACTTA CACCACTAGC CTGGGTGCTG GTCCCGTCTC CATTCTGCG GTTGCCGTTT	6947
TAGCCCCCA CTCTGCGCTA GCATTGCTTG AGGATACCTT GGACTACCCT GCCCGCGCCC	7007
ATACTTTTGA TGATTTCTGC CCAGAGTGCC GCCCCCTTGG CCTTCAGGGC TCGCTTTTCC	7067
AGTCTACTGT CGCTGAGCTT CAGCGCCTTA AGATGAAGGT GGGTAAACT CGGGAGTTGT	7127
AG TTTATTTGCT TGTGCCCCC TTCTTTCTGT TGCTTATTC TCATTTCTGC	7179
GTTCCGCGCT CCCTGA	7195

a fourth sequence (SEQ ID NO.10):

20  
25  
30  
35  
40  
45  
50  
55

GCCATGGAGG CCCACCAGT CATTAAGGCT CCTGGCATCA CTA CTGCTAT TGAGCAAGCA	60
GCTCTAGCAG CGGCCAACTC CGCCCTTGCG AATGCTGTGG TGGTCCGGCC TTTCTTTTCC	120
CATCAGCAGG TTGAGATCCT TATAAATCTC ATGCAACCTC GGCAGCTGGT GTTTCGTCCT	180
GAGGTTTTTT GGAATCACCC GATTCAACGT GTTATACATA ATGAGCTTGA GCAGTATTGC	240
CGTGCTCGCT CGGGTCGCTG CCTTGAGATT GGAGCCCACC CACGCTCCAT TAATGATAAT	300
CCTAATGTCC TCCATCGCTG CTTTCTCCAC CCCGTCGGCC GGGATGTTCA GCGCTGGTAC	360
ACAGCCCCGA CTAGGGGACC TGGGCGAAC TGTGCGCGCT CGGCACTTCG TGGTCTGCCA	420
CCAGCCGACC GCACTTACTG TTTTGATGGC TTTGCCGGCT GCCGTTTTGC CGCCGAGACT	480
GGTGTGGCTC TCTATTCTCT CCATGACTTG CAGCCGGCTG ATGTTGCCGA GGCATGGCT	540
CGCCACGGCA TGACCCGCCT TTATGCAGCT TTCCACTTGC CTCCAGAGGT GCTCCTGCCT	600
CCTGGCACCT ACCGGACATC ATCCTACTTG CTGATCCACG ATGGTAAGCG CGCGGTTGTC	660
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CCTTACCCGC GTTCGACGGA GGTCTATGTC CGGTCTATCT TTGGGCCCGG CGGGTCCCCG	900
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GAAGGCTGGA ATGCCACCGA GGATGCGCTC ACTGCAGTTA TTACGGCGGC TTACCTCACA	1140
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5	GCCGGGTTC ATCTCGACCC CCGCACCTTA GTTTTGTATG AGTCAGTGCC TTGTAGCTGC	1380
	CGAACCACCA TCCGGCGGAT CGCTGGAAAA TTTTGCTGTT TTATGAAGTG GCTCGGTCAG	1440
10	GAGTGTTCCT GTTTCCTCCA GCGCGCCGAG GGGCTGGCGG GCGACCAAGG TCATGACAAT	1500
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15	GACCTGGTAG CTCGCGCAGC CCGACTGTCT GCTACAGTTA CTGTTACTGA AACCTCTGGC	1680
	CGTCTGGATT GCCAAACAAT GATCGGCAAT AAGACTTTTC TCACTACCTT TGTGATGGG	1740
20	GCACGCCTTG AGGTTAACGG GCCTGAGCAG CTTAACCTCT CTTTGTACAG CCAGCAGTGT	1800
	AGTATGGCAG CCGGCCCGTT TTGCCTCACC TATGCTGCCG TAGATGGCGG GCTGGAAGTT	1860
	CATTTTTCCA CCGCTGGCCT CGAGAGCCGT GTTGTTCCTC CCCCTGGTAA TGCCCCGACT	1920
25	GCCCCGCCGA GTGAGGTCAC CGCCTTCTGC TCAGCTCTTT ATAGGCACAA CCGGCAGAGC	1980
	CAGCGCCAGT CGGTTATTGG TAGTTTGTGG CTGCACCCTG AAGGTTTGCT CGGCCTGTTC	2040
30	CCGCCCTTTT CACCCGGGCA TGAGTGCGG TCTGCTAACC CATTTTGCAG CGAGAGCACG	2100
	CTCTACACCC GCACTTGCTC CACAATTACA GACACACCCT TAACTGTCGG GCTAATTTCC	2160
	GGTCAITGG ATGCTGCTCC CCACTCGGGG GGGCCACCTG CTAAGTCCAC AGGCCCTGCT	2220
35	GTAGGCTCGT CTGACTCTCC AGACCCTGAC CCGCTACCTG ATGTTACAGA TGGCTCACGC	2280
	CCCTCTGGGG CCCGTCCGGC TGGCCCCAAC CCGAATGGCG TTCCGCAGCG CCGCTTACTA	2340
40	CACACCTACC CTGACGGCGC TAAGATCTAT GTCGGCTCCA TTTTCGAGTC TGAGTGACCC	2400
	TGGCTTGTC ACGCATCTAA CGCCGGCCAC CGCCCTGGTG GCGGGCTTTG TCATGCTTTT	2460
	TTTCAGCGTT ACCCTGATTC GTTTGACGCC ACCAAGTTTG TGATGCGTGA TGGTCTTGCC	2520
45	GCGTATACCC TTACACCCCG GCCGATCATT CATGCGGTGG CCCCAGCTA TCGATTGGAA	2580
	CATAACCCCA AGAGGCTCGA GGCTGCCTAC CGCGAGACTT GCGCCCGCCG AGGCACTGCT	2640
50	GCCTATCCAC TCTTAGGCGC TGGCATTTAC CAGGTGCCTG TTAGTTTGAG TTTTGATGCC	2700
	TGGGAGCGGA ACCACGCCC GTTTGACGAG CTTTACCTAA CAGAGCTGGC GGCTCGGTGG	2760
	TTTGAATCCA ACCGCCCCGG TCAGCCCACG TTGAACATAA CTGAGGATAC CGCCCGTGCG	2820
55	GCCAACCTGG CCCTGGAGCT TGAATCCGGG AGTGAAGTAG GCCGCGCATG TGCCGGGTGT	2880

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	AAAGTCGAGC CTGGCGTTGT GCGGTATCAG TTTACAGCCG GTGTCCCCGG CTCTGGCAAG	2940
	TCAAAGTCCG TGCAACAGGC GGATGTGGAT GTTGTGTTG TGCCCACTCG CGAGCTTCGG	3000
5	AACGCTTGGC GGCGCCGGGG CTTTGCGGCA TTCACTCCGC ACACTGCGGC CCGTGCTACT	3060
	AGCGGCCGTA GGGTTGTCAT TGATGAGGCC CCTTCGCTCC CCCCACACTT GCTGCTTTTA	3120
10	CATATGCAGC GTGCTGCATC TGTGCACCTC CTTGGGGACC CGAATCAGAT CCCC GCCATA	3180
	GATTTTGAGC ACACCGGTCT GATTCCAGCA ATACGGCCGG AGTTGGTCCC GACTTCATGG	3240
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15	AAAATCCAGA CTACAAGTAA GGTGCTCCGT TCCCTTTTCT GGGGAGAGCC AGCTGTGCGC	3360
	CAGAAGCTAG TGTTACACA GGCTGCTAAG GCCGCGCACC CCGGATCTAT AACGGTCCAT	3420
20	GAGGCCCAGG GTGCCACTTT TACCACTACA ACTATAATTG CAACTGCAGA TGCCCGTGGC	3480
	CTCATACAGT CCTCCCGGGC TCACGCTATA GTTGCTCTCA CTAGGCATAC TGAAAAATGT	3540
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25	AATTTCTTCC TTTGCGGTGG CGAGGTTGGT CACCAGAGAC CATCGGTCAT TCCGCGAGGC	3660
	AACCCTGACC GCAATGTTGA CGTGCTTGCG GCGTTTCAC CTTTCATGCCA AATAAGCGCC	3720
30	TTCCATCAGC TTGCTGAGGA GCTGGGCCAC CGGCCGGCGC CGGTGGCGGC TGTGCTACCT	3780
	CCCTGCCCTG AGCTTGAGCA GGGCCTTCTC TATCTGCCAC AGGAGCTAGC CTCCTGTGAC	3840
	AGTGTGTGA CATTGAGCT AACTGACATT GTGCACTGCC GCATGGCGGC CCCTAGCCAA	3900
35	AGGAAAGCTG TTTGTCCAC GCTGGTAGGC CGGTATGGCA GACGCACAAG GCTTTATGAT	3960
	GCGGGTCACA CCGATGTCCG CGCCTCCCTT GC6GCTTTA TTCCCACTCT C6GGCGGGTT	4020
40	ACTGCCACCA CCTGTGAACCT CTTTGAGCTT GTAGAGGCGA TGGTGGAGAA GGGCCAAGAC	4080
	GGTTCAGCCG TCCTCGAGTT GGATTTGTGC AGCCGAGATG TCTCCCGCAT AACCTTTTTT	4140
	CAGAAGGATT GTAACAAGTT CACGACCGGC GAGACAATTG CGCATGGCAA AGTCGGTCAG	4200
45	GGTATCTTCC GCTGGAGTAA GACGTTTTGT GCCCTGTTT G6CCCTGGTT CCGTGCGATT	4260
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50	TCAGTATTCT CTGCTGCCGT GGCTGGCGCC AGCCATGCCA TGGTGTGGA AAATGATTTT	4380
	TCTGAGTTTG ACTCGACTCA GAATAACTTT TCCCTAGGTC TTGAGTGC6C CATTATGGAA	4440
	GAGTGTGGTA TGCCCCAGTG GCTTGTGAGG TTGTACCATG CCGTCCGGTC G6CGTGGATC	4500
55	CTGCAGGCCC CAAAAGAGTC TTTGAGAGGG TTCTGGAAGA AGCATTCTGG TGAGCCGGGC	4560

	AGCTTGCTCT GGAATACGGT GTGGAACATG GCAATCATTG CCCATTGCTA TGAGTTCCGG	4620
	GACCTCCAGG TTGCCGCCCTT CAAGGGCGAC GACTCGGTCTG TCCTCTGTAG TGAATACCGC	4680
5	CAGAGCCCAG GCGCCGGTTC GCTTATAGCA GGCTGTGGTT TGAAGTTGAA GGCTGACTTC	4740
	CGGCCGATTG GGCTGTATGC CGGGGTTGTC GTCGCCCCGG GGCTCGGGGC CCTACCCGAT	4800
10	GTGTTTCGAT TCGCCGGACG GCTTTCGGAG AAGAACTGGG GGCCTGATCC GGAGCGGGCA	4860
	GAGCAGCTCC GCCTCGCCGT GCAGGATTC CTCCGTAGGT TAACGAATGT GGCCAGATT	4920
	TGTGTTGAGG TGGTGTCTAG AGTTTACGGG GTTTCCCCGG GTCTGGTTCA TAACCTGATA	4980
15	GGCATGCTCC AGACTATTGG TGATGGTAAG GCGCATTTTA CAGAGTCTGT TAAGCCTATA	5040
	CTTGACCTTA CAACTCAAT TATGCACCGG TCTGAATGAA TAACATGTGG TTTGCTGCGC	5100
20	CCATGGGTTT GCCACCATGC GCCCTAGGCC TCTTTTGCTG TTGTTCTCTT TGTTCCTGCC	5160
	TATGTTGCCC GCGCCACCGA CCGGTCAGCC GTCTGGCCGC CGTCGTGGGC GGCGCAGCGG	5220
	CGGTACCGGC GGTGGTTTCT GGGGTGACCG GGTGATTCT CAGCCCTTCG CAATCCCCTA	5280
25	TATTCATCCA ACCAACCCCT TTGCCCCAGA CGTTGCCGCT GCGTCCGGGT CTGGACCTCG	5340
	CCTTCGCCAA CCAGCCCGGC CACTTGGCTC CACTTGGCGA GATCAGGCC AGCGCCCTC	5400
30	CGCTGCCTCC CGTCGCCGAC CTGCCACAGC CGGGGCTGCG GCGCTGACGG CTGTGGCGCC	5460
	TGCCCATGAC ACCTCACCCG TCCCGGACGT TGATTCTCGC GGTGCAATTC TACGCCGCCA	5520
	GTATAATTTG TCTACTTCAC CCCTGACATC CTCTGTGGCC TCTGGCACTA ATTTAGTCCT	5580
35	GTATGCAGCC CCCCTTAATC CGCCTCTGCC GCTGCAGGAC GGTACTAATA CTCACATTAT	5640
	GGCCACAGAG GCCTCCAATT ATGCACAGTA CCGGGTTGCC CCGCTACTA TCCGTTACCG	5700
40	GCCCCTAGTG CCTAATGCAG TTGGAGGCTA TGCTATATCC ATTTCTTTCT GGCCTCAAAC	5760
	AACCACAACC CCTACATCTG TTGACATGAA TTCCATTACT TCCACTGATG TCAGGATTCT	5820
	TGTTCAACCT GGCATAGCAT CTGAATTGGT CATCCCAAGC GAGCGCCTTC ACTACGCAA	5880
45	TCAAGGTTGG CGCTCGGTTG AGACATCTGG TGTGCTGAG GAGGAAGCCA CCTCCGGTCT	5940
	TGTCATGTTA TGCATACATG GCTCTCCAGT TAACTCCTAT ACCAATACCC CTTATACCGG	6000
50	TGCCCTTGGC TTA CTGGACT TTGCCTAGA GCTTGAGTTT CGCAATCTCA CCACCTGTAA	6060
	CACCAATACA CGTGTGTCCC GTTACTCCAG CACTGCTCGT CACTCCGCCC GAGGGGCCGA	6120
	CGGGACTGCG GAGCTGACCA CAACTGCAGC CACCAGGTTT ATGAAAGATC TCCACTTTAC	6180
55	CGGCCTTAAT GGGGTAGGTG AAGTCGGCCG CGGGATAGCT CTAACATTAC TTAACCTTGC	6240

	TGACACGCTC CTCGGCGGGC TCCCGACAGA ATTAATTTTC TCGGCTGGCG GGCAACTGTT	6300
	TTATCCCGC CCGGTTGTCT CAGCCAATGG CGAGCCAACC GTGAAGCTCT ATACATCAGT	6360
5	GGAGAATGCT CAGCAGGATA AGGGTGTTC TATCCCCAC GATATCGATC TTGGTGATTC	6420
	GCGTGTGGTC ATTCAGGATT ATGACAACCA GCATGAGCAG GATCGGCCA CCCCCTGCC	6480
10	TGCGCCATCT CGGCCTTTT CTGTTCTCCG AGCAAATGAT GTACTTTGGC TGTCCCTCAC	6540
	TGCAGCCGAG TATGACCAGT CCACTTACGG GTCGTCAACT GGCCCGGTTT ATATCTCGGA	6600
	CAGCGTGAATG TTGGTGAATG TTGCGACTGG CGCGCAGGCC GTAGCCCGAT CGCTTGACTG	6660
15	GTCCAAAGTC ACCCTCGACG GCGGCCCCCT CCCGACTGTT GAGCAATATT CCAAGACATT	6720
	CTTTGTGCTC CCCCTTCGTG GCAAGCTCTC CTTTGGGAG GCCGGCACAA CAAAAGCAGG	6780
20	TTATCCTTAT AATTATAATA CTACTGCTAG TGACCAGATT CTGATTGAAA ATGCTGCCGG	6840
	CCATCGGGTC GCCATTTCAA CCTATACCAC CAGGCTTGGG GCCGGTCCGG TCGCCATTTT	6900
	TGCGGCCGCG GTTTTGGCTC CACGCTCCGC CCTGGCTCTG CTGGAGGATA CTTTGTATTA	6960
25	TCCGGGGCGG GCGCACACAT TTGATGACTT CTGCCCTGAA TGCCGCGCTT TAGGCCTCCA	7020
	GGGTTGTGCT TTCCAGTCAA CTGTCGCTGA GCTCCAGCGC CTAAAGTTA AGGTGGGTAA	7080
30	AACTCGGGAG TTGTAGTTTA TTTGGCTGTG CCCACCTACT TATATCTGCT GATTCCTTT	7140
	ATTCCTTTT TCTCGGTCCC GCGCTCCCTG A	7171

or a fifth sequence (SEQ ID NO.12):

35	CGGGCCCCGT ACAGGTCACA ACCTGTGAGT TGACGAGCT AGTGGAGGCC ATGGTCGAGA	60
	AAGGCCAGGA TGGCTCCGCC GTCCTGAGC TCGATCTCTG CAACCGTGAC GTGTCCAGGA	120
	TCACCTTTTT CCAGAAAGAT TGCAATAAGT TCACCACGGG AGAGACCATC GCCCATGGTA	180
40	AAGTGGGCCA GGGCATTTCG GCCTGGAGTA AGACCTTCTG TGCCCTTTTC GGCCCTGGT	240
	TCCGTGCTAT TGAGAAGGCT ATTCTGGCCC TGCTCCCTCA GGGTGTGTTT TATGGGGATG	300
45	CCTTTGATGA CACCGTCTTC TCGGCGCGTG TGGCCGAGC AAAGGCGTCC ATGGTGTGTTG	360
	AGAATGACTT TTCTGAGTTT GACTCCACCC AGAATAATTT TTCCCTGGGC CTAGAGTGTG	420
	CTATTATGGA GAAGTGTGGG ATGCCGAAGT GGCTCATCCG CTTGTACCAC CTTATAAGGT	480
50	CTGCGTGGAT CCTGCAGGCC CCGAAGGAGT CCCTGCGAGG GTGTTGGAAG AAACACTCCG	540
	GTGAGCCCGG CACTCTTCTA TGAATACTG TCTGGAACAT GGCCGTTATC ACCCATTTGT	600
55	ACGATTTCG CGATTTCAG GTGGCTGCCT TTAAAGGTGA TGATTCGATA GTGCTTTGCA	660
	GTGAGTACCG TCAGAGTCCA GGGGCTGCTG TCCTGATTGC TGGCTGTGGC TTAAAGCTGA	720



	AGGTGGGTTT CCGTCCGATT GGTTTGTATG CAGGTGTTGT GGTGACCCCC GGCCTTGGCG	780
	CGCTTCCCGA CGTCGTGCGC TTGTCCGGCC GGCTTACTGA GAAGAATTGG GGCCTGGCC	840
5	CTGAGCGGGC GGAGCAGCTC CGCCTTGCTG TGCG	874

or a sequence complementary thereto.

10           14. A kit comprising, in a container or separate  
containers, a pair of single-strand primers derived  
from nonhomologous regions of opposite strands of a  
DNA duplex fragment derived from an enterically  
transmitted viral hepatitis agent whose genome  
15 contains a region which is homologous to the 1.33 kb  
DNA EcoRI insert present in plasmid pTZKF1(ET1.1)  
carried in E. coli strain BB4 and having ATCC deposit  
no. 67717.

20           15. The kit of claim 15, which are derived from  
opposite strands of the EcoRI duplex insert in said  
plasmid.

25           16. A method for detecting the presence of an  
enterically transmitted nonA/nonB hepatitis viral  
agent in a biological sample, comprising  
              preparing a mixture of duplex DNA fragments  
derived from the sample,  
              denaturing the duplex fragments,  
30           adding to the denatured DNA fragments, a pair of  
single-strand primers derived from nonhomologous  
regions of opposite strands of a DNA duplex fragment  
derived from an enterically transmitted viral  
hepatitis agent whose genome contains a region which  
35 is homologous to the 1.33 kb DNA EcoRI insert present  
in plasmid pTZKF1(ET1.1) carried in E. coli strain  
BB4, and having ATCC deposit no. 67717,  
              hybridizing said primers to homologous-sequence  
region of opposite strands of such duplex DNA

fragments derived from enterically transmitted nonA/nonB hepatitis agent,

reacting the primed fragment strands with DNA polymerase in the presence of DNA nucleotides, to form new DNA duplexes containing the primer sequences, and repeating said denaturing, adding, hybridizing and reacting steps, until a desired degree of amplification of sequences is achieved.

17. The method of claim 16, wherein the primers are derived from opposite strands of the EcoRI duplex insert in said plasmid.

18. The method of claim 16, for detecting the presence of viral agent in a sample of cultured cells infected with the agent.

19. A vaccine for immunizing an individual against enterically transmitted nonA/nonB hepatitis viral agent comprising, in a pharmacologically acceptable adjuvant, a recombinant protein derived from an enterically transmitted nonA/nonB viral hepatitis agent whose genome contains a region which is homologous to the 1.33 kb DNA EcoRI insert present in plasmid pTZ-RF1(ET1.1) carried in E. coli strain BB4, and having ATCC deposit no. 67717.

20. The vaccine of claim 19, wherein the protein is derived from the EcoRI insert in said plasmid.

21. A vaccine for immunizing an individual against HEV comprising, in a pharmacologically acceptable adjuvant, a protein encoded by genetic sequence 406.3-2 or 406.4-2 or a fragment thereof.

22. In a method of isolating an enterically transmitted nonA/nonB viral agent or a nucleic acid fragment produced by the agent, an improvement which

comprises: utilizing, as a source of said agent, bile obtained from a human or cynomolgus monkey having an active infection of enterically transmitted non-A/non-B hepatitis.

5

23. The method of claim 22, wherein the bile is obtained from an infected cynomolgus monkey.

10

24. Human polyclonal anti-serum obtained from a human immunized with a protein derived from an enterically transmitted non-A/non-B viral hepatitis agent whose genome contains a region which is homologous to the 1.33 kb DNA EcoRI insert present in plasmid pTZKF1(ET1.1) carried in E. coli strain BB4 and having ATCC deposit no. 67717.

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